

REMARKS

Claims 25-47 are pending upon entry of the amendments. A listing of the claims can be found at pp. 2-5 above. Favorable reconsideration in light of the amendments and the remarks which follow is respectfully requested.

Amendments

Claims 25 and 45 have been amended for clarity as indicated above. These amendments were necessary to obviate the clarity objections and do not require a new search. Accordingly, it is kindly requested that these amendments be entered.

Objection

Claims 25 and 45 stands objected to due to minor informalities. Claims 25 and 45 have been amended, as indicated above, to remove these informalities. As such, it is respectfully requested that this objection be withdrawn.

First Obviousness Rejection

Claims 25, 31, 32 and 34-40 stand rejected under 35 U.S.C. §103(a) over Winsor, *et al* (GB 1,144,498, hereinafter Winsor), Brahma, *et al*. (US 5,482,616, hereinafter Brahma) and Kimber, *et al* (US 5,059,539, hereinafter Kimber). It is respectfully requested that this rejection be withdrawn at least because Winsor, Brahma and Kimber, taken alone or in combination, fail to render claims 25, 31, 32 and 34-40 obvious.

Independent claim 25 recites in part, "**contacting the feedstock with an oxide of a metal** that forms stable sulfides under the conditions applied in the process for the removal of contaminating sulfur compounds using the sulfided nickel adsorbent from the hydrocarbon feedstock **while contacting the feedstock with the nickel adsorbent.**" Winsor, which relates to a process for desulfurization of an aromatic hydrocarbon-containing fraction, Brahma, which relates to a catalyst for hydrogenation with an improved resistance against deactivation by sulfur compounds, and Kimber, which relates to a method of testing a heterogeneous or homogeneous catalyst, taken alone or in combination, fail to disclose, teach or suggest at least this feature as recited in

independent claim 25.

Winsor describes a process for desulfurization of aromatic compounds using a sulfide supported nickel material in the presence of hydrogen. Winsor also describes that the process may also comprise a catalytic hydrodesulfurization step and that a suitable hydrodesulfurization catalyst to use is cobalt and molybdenum oxides on aluminum. See p. 2, lines 30-45. However, Winsor fails to disclose, teach or suggest using *both* a sulfide nickel adsorbent and metal oxide adsorbent to remove sulfur compounds from hydrocarbon feedstocks as recited in independent claim 25.

The Final Office Action at p. 10 argues, "Winsor discloses contacting the feed stock in the presence of hydrogen with a sulfided nickel adsorbent," citing p. 1, lines 23-26. The Final Office Action at pp. 10-11 also assert, "Winsor also discloses contacting the feed stocks with metal oxides . . . for the removal of contaminating sulfur compounds before using the sulfide nickel adsorbent from the hydrocarbon feedstock," citing p. 2, lines 30-45. Applicants' representative asserts that contacting the feed stocks with metal oxides before using the sulfide nickel adsorbent is different from the process as recited in independent claim 25, which requires the oxide of a metal to contact a feedstock ***while contacting the feedstock with the nickel adsorbent***.

Unlike the process of independent claim 25, which requires the metal oxide to contact the feedstock at the same time as contacting the feedstock with a nickel adsorbent, Winsor clearly requires the cobalt and molybdenum oxides to be used **before** feedstock is desulfurized. The Final Office Action at p. 10 even admits that the feed stock is contacted with the metal oxides before the feedstock is contacted with the sulfide nickel adsorbent. Specifically, Winsor describes at p. 2, lines 30-38:

If desired feedstocks containing large amounts of sulfur may be subjected to any of the known catalytic hydrodesulphurization processes before being desulphurized by the present process. Such known processes should employ catalysts of poor hydrogenation activity, for example cobalt and molybdenum oxides on alumina.

Winsor merely describes a pretreatment process using a metal oxide. On the other hand, independent claim 25 recites contacting the feedstock with a metal oxide while contacting the feedstock with the sulfide nickel adsorbent rather than pretreatment.

This provides at least the advantage of more reliable sulfur removal (see Spec. at paragraph [0026]) when compared to other processes (e.g., the process described by Winsor). Therefore, Winsor fails to disclose, teach or suggest at least contacting the feedstock with a metal oxide while contacting the feedstock with the sulfide nickel adsorbent as recited in independent claim 25.

Moreover, Winsor describes that the hydrodesulfurization catalyst removes contaminating sulfur compounds by converting them to hydrogen sulfide. See p. 2, lines 41-43. This is completely different to the process as recited in independent claim 25, where the metal of the metal oxide adsorbent forms a stable sulfide compound with the contaminating sulfur compounds. A person having ordinary skill in the art would not obtain claim 25 from Winsor because the processes are distinctly different. Additionally, a person having ordinary skill in the art would know that the hydrodesulfurization catalyst utilized by Winsor is different from a metal oxide adsorbent recited in independent claim 25.

Brahma does not remedy the aforementioned deficiencies of Winsor. Brahma describes a process for hydrogenation and/or dehydrogenation using a hydrogenating component with a metal oxide in either two beds or a mixed bed. See col. 2, lines 44-53; col. 3, lines 3-9; col. 4, lines 4-9; Example II. The process described by Brahma aims to increase the lifetime of a hydrogenation catalyst by reducing its sensitivity to deactivation by sulfur compounds. See col. 1, lines 33-37. Brahma also suggests that sulfur compounds are hydrogenated by a hydrogenated compound releasing sulfur atoms, which react with a metal oxide to form a metal sulfide. See col. 4, lines 10-20. Claim 25, on the other hand, describes a process for removing sulfur compounds without hydrogenating aromatic compounds, such as benzene, toluene, tetralins, *etc.* Brahma fails to disclose, teach or suggest that the metal oxide can be used to remove contaminating sulfur compounds, such as thiophenes, without aromatic hydrogenation as the process of claim 25. Therefore, the hydrogenation component of Brahma, which hydrogenates hydrocarbons and the nickel adsorbent of claim 25, which does not hydrogenate aromatic hydrocarbons, are not equivalent.

The Final Office Action at p. 11 argues that, "According to MPEP, '[i]t is prima facie obvious to combine two compositions each of which is taught by the prior art to be

useful for the same purpose in order to form a third composition to be used for the very same purpose,” citing *In re Kerkhoven*, 626 F.2d 846, 850. *Kerkhoven* claimed a process for preparing a spray-dried detergent by mixing together two conventional spray-dried detergents that was found to be *prima facie* obvious because “the idea of combining them flows logically from their having been individually taught in the prior art.” However, the idea of combining the processes of Winsor and Brahma does not flow logically.

The different processes of Winsor and Brahma are distinctly different, since Winsor aims to prevent appreciable hydrogenation of hydrocarbons (see Winsor at p. 1, lines 50-53), while Brahma aims to improve the hydrogenation of hydrocarbons (see Brahma at col. 1, lines 39-42), therefore no person having ordinary skill in the art would find that combining the processes of Winsor and Brahma flows logically. Further, neither Winsor nor Brahma, taken alone or in combination, disclose, teach or suggest that the removal of sulfide compounds would be significantly improved by the combined use of a sulfide nickel adsorbent with a metal oxide adsorbent as in the process of claim 25. The skilled person would have no motivation to combine the teachings of Winsor and Brahma, as they would not expect such a result. Therefore, claim 25 is not obvious over Winsor and Brahma.

Kimber fails to remedy the aforementioned deficiencies of Winsor and Brahma. Instead, Kimber merely describes a method for testing the activity of a catalyst in which naphthalene is reversibly hydrogenated. See, e.g., Abstract. Kimber clearly fails to disclose, teach or suggest contacting a feedstock with a metal oxide while contacting the feedstock with a nickel adsorbent because Kimber is silent with regard to at least this feature.

For at least the above reasons, Winsor, Brahma and Kimber, taken alone or in combination, fail to disclose, teach or suggest at least, “contacting the feedstock with an oxide of a metal that forms stable sulfides under the conditions applied in the process for the removal of contaminating sulfur compounds using the sulfided nickel adsorbent from the hydrocarbon feedstock while contacting the feedstock with the nickel adsorbent” as recited in independent claim 25. Additionally, no person having ordinary skill in the art would combine the teachings of Winsor, Brahma, and Kimber. As such,

Winsor, Brahma and Kimber fail to render independent claim 25, as well as associated dependent claims 31, 32, and 34-40 obvious. As such, it is respectfully requested that this rejection be withdrawn and claims 25, 31, 32 and 34-40 allowed.

Second Obviousness Rejection

Claims 26-30, 33 and 41-47 stand rejected under 35 U.S.C. §103(a) over Winsor, Brahma, Kimber, Bouwman, *et al* (US 5,223,470, hereinafter Bouwman) and Archibald (US 2,951,034, hereinafter Archibald). Claims 26-30, 33 and 41-47 depend from independent claim 25. At least for the reasons as described above, Winsor, Brahma and Kimber, taken alone or in combination, fail to render independent claim 25 obvious.

Bouwman, which describes a nickel on alumina catalyst that has been promoted with sulfur, does not remedy the deficiencies of Winsor, Brahma and Kimber. Specifically, Bouwman does not disclose, teach or suggest at least, "contacting the feedstock with an oxide of a metal that forms stable sulfides under the conditions applied in the process for the removal of contaminating sulfur compounds using the sulfided nickel adsorbent from the hydrocarbon feedstock while contacting the feedstock with the nickel adsorbent" as recited in independent claim 25.

Archibald, which describes the separation of sulfur compounds from petroleum using a special adsorbent material, does not remedy the deficiencies of Winsor, Brahma, Kimber and Bouwman. Specifically, Archibald does not disclose, teach or suggest at least, "contacting the feedstock with an oxide of a metal that forms stable sulfides under the conditions applied in the process for the removal of contaminating sulfur compounds using the sulfided nickel adsorbent from the hydrocarbon feedstock while contacting the feedstock with the nickel adsorbent" as recited in independent claim 25.

Accordingly, for at least these reasons, Winsor, Brahma, Kimber, Bouwman and Archibald, taken alone or in combination, do not disclose, teach or suggest at least the above feature as recited in independent claim 25. At least by virtue of dependence, Winsor, Brahma, Kimber, Bouwman and Archibald, taken alone or in combination, do not disclose, teach or suggest each and every feature as recited in associated dependent claims 26-30, 33 and 41-47. Therefore, Winsor, Kimber and Bouwman,

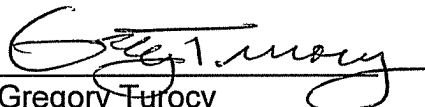
taken alone or in combination, do not render claims 26-30, 33 and 41-47 obvious. Accordingly, it is respectfully requested that this rejection be withdrawn and claims 26-30, 33 and 41-47 allowed.

In the event any additional fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063.

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

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